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| 10/593,876   | 09/22/2006  | Philippe Robert        | 129533              | 5467             |
| 25944 7590 04/11/2008<br>OLIFF & BERRIDGE, PLC<br>P.O. BOX 320850<br>ALEXANDRIA, VA 22320-4850 |             |                        |                     |                  |
| EXAMINER<br>THOMAS, BRADLEY H  |             |                        |                     |                  |
| ART UNIT<br>2835   |             | PAPER NUMBER           |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/593,876

**Applicant(s)**

ROBERT, PHILIPPE

**Examiner**

BRADLEY H. THOMAS

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 9/22/06  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figs. 1-3 (see near character 2), and 6 and 9 (see near character 21) have details that are hard to see, particularly the end portions. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 1-9 are objected to because of the following informalities:

Regarding Claim 1, line 6-7, the portion "...formed on a bottom surface, in a second stable position..." seems awkwardly phrased and a revision should be considered. In line 11, it is believed that "the" or "said" should be inserted before "microswitch". In line 13 "the ends" lacks antecedent basis. In line 15, "the high deformation areas" lacks antecedent basis.

Regarding Claims 2-9, line 1 of each claim, the word "The" or "A" should be inserted before "Microswitch", and "Microswitch" changed to "microswitch".

Further regarding Claim 3, line 3, "the central part" lacks antecedent basis.

Applicant is advised to thoroughly review the claims for the above and any other errors. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson (US 2004/0061579) in view of Charvet et al. (US 6,703,916).

Regarding Claim 1, Nelson teaches a microswitch comprising:

- a deformable membrane (comprising 14, 20) attached to a substrate (12),
- actuating means (28, 30) designed to deform the membrane (see Figs. 3-5), from a first stable position (e.g. Fig. 1) of the microswitch (10), in such a way as to establish an electric contact between at least a first conducting pad (18) formed on the substrate (12) and at least a second conducting pad (26) formed on a bottom surface of the membrane (see Fig. 1), in a second stable position (e.g. Figs. 3-5), and
- electrostatic holding means (16, 22) designed to hold the microswitch (10) in the second stable position and comprising electrostatic holding means (16, 22) respectively fixedly secured to the substrate (12), the microswitch characterized in that the membrane comprises at least:

- two substantially parallel flexure arms (20, see Fig. 2a) attached to the substrate (12) via at least one of the ends (via 24) thereof and comprising the actuating means (28, 30), and
- at least one contact arm (14), substantially parallel to the flexure arms (20), arranged between the flexure arms (20) and attached to the flexure arms (20) in the high deformation areas of the flexure arms (see Fig. 2a), the contact arm (14) moving in a direction substantially parallel to the substrate (12) on actuation of the microswitch (10), and comprising the second conducting pad (18).

except for:

- electrostatic holding means designed to hold the microswitch in the second stable position and comprising *complementary electrostatic holding means respectively fixedly secured to the membrane* and to the substrate,
- the contact arm comprising the electrostatic holding means of the membrane.

Charvet et al. teaches that it is known to have a complimentary pair of electrostatic holding means (16/17 and 18/19) on a membrane (11) and substrate (1) of a microswitch (see Fig. 2). It would have been obvious to one having ordinary skill in the microswitch art at the time the invention was made to have used complimentary holding means as taught by Charvet et al. in the device of Nelson, since Charvet et al. states at col. 4, lines 5-26 that such a modification would have allowed for increased control of the deformable element , thus allowing for increased control of the overall switch.

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Regarding Claim 2, Nelson discloses:

- the contact arm (14) is elongate (see Fig. 2a).

except for:

- the contact arm supporting the electrostatic holding means.

Charvet et al. teaches that it is known to have a complimentary pair of electrostatic holding means (16/17 and 18/19) on a membrane (11) and substrate (1) of a microswitch (see Fig. 2). It would have been obvious to one having ordinary skill in the microswitch art at the time the invention was made to have used complimentary holding means as taught by Charvet et al. in the device of Nelson, since Charvet et al. states at col. 4, lines 5-26 that such a modification would have allowed for increased control of the beam, thus allowing for increased control of the overall switch.

Regarding Claim 3, Nelson discloses:

- the contact arm (14) being attached, via the central part thereof, to the flexure arms (20) at the level of their respective central parts (see Fig. 2a).

except for:

- two ends of the flexure arms are fixedly secured to the substrate.

Charvet et al. teaches that it is known to have ends of an arm element of a membrane (11) be secured to a substrate (1) and contact arms (2, 3) attached centrally to the arm (11) (see Fig. 1). It would have been obvious to one having ordinary skill in the switch art at the time the invention was made to have attached the arms together and to the substrate as taught by Charvet et al., since Charvet et al. states at that such a

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modification would have improved the ability of the arms to bend and thus ensure electrical continuity (see col. 3, line 3, line 40 to col. 4, line 4).

Regarding Claim 4, Nelson teaches:

- the flexure arms having a second end (see Fig. 2a) fixedly secured to the contact arm (14), the second ends of two adjacent flexure arms (20) being respectively fixedly secured to opposite (left and right) ends of the corresponding contact arm (14) (see Fig. 2a).

except for:

- each flexure arm comprises a first end *fixedly secured* to the substrate.

Nelson teaches indirect attachment of the arms (20) to the substrate (12) via 24.

Charvet et al. teaches that it is known to fixedly secure ends of an arm (11, see Fig. 1) to a substrate (1). It would have been obvious to one having ordinary skill in the microswitch art at the time the invention was made to have secured to arm to the substrate as taught by Charvet et al., since Charvet et al. states at col. 3, line 40 to col. 4, line 4 that such a modification would have allowed for the arms to bend toward the substrate and achieve electrical continuity.

Regarding Claims 5-6, Nelson discloses the claimed invention except for:

- the actuating means of the microswitch comprise a thermal actuator.
- the thermal actuator comprises a heating resistor inserted in at least one end of the flexure arms.

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Charvet et al. teaches that it is known to have a microswitch with a thermal actuator in the form of heating resistors (14, 15) (see 0008] and Fig. 1a). It would have been obvious to one having ordinary skill in the microswitch art at the time the invention was made to have used heating resistors as taught by Charvet et al. in the device of Nelson, since Charvet et al. states at col. 3, line 48 to col. 4, line 4 that such a modification would have caused the beam to bend, thus ensuring electrical continuity. The implementation of thermal actuators in the form of heating resistors would have thus enabled more effective operation of the switch and more certain continuity of the switch upon actuation.

Regarding Claim 7, Nelson discloses the claimed invention except for explicitly teaching:

- the actuating means of the microswitch comprise a piezoelectric actuator.

However, Nelson states at [0042] that the beams (14 and 20) may bend due to piezoelectric deformations. Thus, it would have been obvious to one having ordinary skill in the art to use piezoelectric means as the actuating means in the invention of Nelson to provide bending of the arms.

Regarding Claim 8, Nelson discloses the claimed invention except for:

- the flexure arms are bimetal strips.

Charvet et al. teaches that it is known to have a membrane (11) that undergoes a bimetallic effect (see Fig. 4 and col. 3, line 65 to col. 4, line 4). It would have been



obvious to one having ordinary skill in the microswitch art at the time the invention was made to have used bimetallic elements for arms as taught by Charvet et al. in the device of Nelson, since bimetallic elements are well known in the switch art. In the case of Charvet et al., the bimetallic elements aid in the bending of the beams into the cavity, which would have ensured desired and reliable operation of the switch.

Regarding Claim 9, Nelson teaches:

- the electrostatic holding means (16, 22) of the membrane comprise at least one electrode (see [0037]).

except for:

- the electrostatic holding means being on the membrane.

Charvet et al. teaches that it is known to have a complimentary pair of electrostatic holding means (16/17 and 18/19) on a membrane (11) and on a substrate (1) of a microswitch (see Fig. 2). It would have been obvious to one having ordinary skill in the microswitch art at the time the invention was made to have used complimentary holding means as taught by Charvet et al. in the device of Nelson, since Charvet et al. states at col. 3, line 54 to col. 4, line 25 that such a modification allows for increased control of the beam, thus allowing for increased control of the overall switch.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references teach microswitches: Mueller (US

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4,423,401), Park et al. (US 5,905,241), Zavracky et al. (US 6,153,839), Minners (US 6,236,300), Albrecht et al. (US 6,239,685), Miyazaki et al. (US 2002/0140533), Petrarca et al. (US 6,489,857), Bouche (US 2005/0206243), Becka et al. (US 6,768,412) and Fouillet (US 6,812, 820).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRADLEY H. THOMAS whose telephone number is (571)272-9089. The examiner can normally be reached on 7:00am - 3:30pm (Eastern).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash N. Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BHT  
/Anatoly Vortman/  
Primary Examiner, Art Unit 2835